Abstract No: 44 ***Natural Sciences***

ISOLATION AND CHARACTERIZATION OF CHICKPEA PROTEIN AND FORMATION OF $CaCO_3$ ENCAPSULATED PROTEIN MICROPARTICLES

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Soya beans are by far the largest provider of plant proteins. Protein isolates are used increasingly in food and non-food applications. The use of plant protein isolates in foods is to improve the nutritional quality of the product. Nevertheless, these protein applications in the food trade are almost limited to soybean seeds, whereas other cereal proteins are less used. Among those, chickpea (*Cicer arietinum* L.) is extensively grown in different parts of the world. This study was performed to isolate protein from chickpea for use as a natural biopolymer. Chick pea powder was defatted using Soxhlet extraction and subject to alkaline treatment. The isolated protein was treated with acid to determine the pI. The pH of 4.5, at which the highest protein mass was obtained was selected as the pI. The amount of protein was determined using Kjeldhal method. The recovery percentage of protein from Chickpea flour was 51.45 % while protein isolated at the pI contained 81.81 % of protein. The protein was subjected to FTIR and peaks at 3421, 1651, 1558 and 1454 cm^{-1} indicated the N-H, C=O, C-N-H and C-N functional groups respectively. According to differential scanning calorimetry, crystallization temperature of the protein was 92.18 ^{0}C. The swelling ratio of the protein showed that within the first 1.5 h it obeys $y = 1.037\ x$ type of equation and within 1.5- 6h time interval it obeys the $y = 0.098\ x + 1.189$ equation *(y-Swelling ratio, x-time)*. This simple method of protein isolation at the pI of the protein can be used for other kinds of cereal as well. This protein was used to formulate $CaCO_3$ entrapped particles using nano $CaCO_3$. Maximum encapsulation efficiency was observed when using 1:1 protein to nano $CaCO_3$ ratio. Observed highest encapsulation efficiency of 65.84%, loading capacity of 9.50% and particle size of 1.431 μm was observed.